

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Cancel)

2. (Cancel)

3. (Cancel)

4. (Cancel)

5. (Currently Amended) An isolated polynucleotide which encodes a protein having β 4 acetylgalactosaminyl transferase activity and which is selected from the group consisting of: the

(A) a polynucleotide which is selected from the group consisting of SEQ ID NO:2 and an expressible coding sequence of SEQ ID NO:2;

(B) a polynucleotide which differs in nucleotide sequence from the polynucleotides of (A) above due to degeneracy of the genetic code and which encodes a protein having β 4 acetylgalactosaminyl transferase activity; and

(C) a polynucleotide which differs in nucleotide sequence from the polynucleotides of (A) or (B) in that said polynucleotide lacks absent a nucleotide sequence which encodes a the transmembrane domain of residues 7-29 of SEQ ID NO:1 wherein the polynucleotide encodes a soluble the β 4 acetylgalactosaminyl transferase encoded is soluble.

6. (Original) The polynucleotide of claim 5 wherein the polynucleotide is DNA.

7. (Original) A vector containing the polynucleotide of claim 5.

8. (Currently Amended) A An isolated host cell transformed or transfected with the vector of claim 7.

9. (Currently Amended) A process for producing a protein having β 4 acetylgalactosaminyl transferase activity comprising the steps of:
culturing the host cell of claim 8, thereby expressing the soluble β 4 acetylgalactosaminyl transferase; and
purifying the soluble β 4 acetylgalactosaminyl transferase from the cultured host cell.

10. (Cancel)

11. (Currently Amended) The isolated host cell of claim 8 wherein the polynucleotide is operatively associated with an expression control sequence contained in said the vector of the host cell.

12. (Currently Amended) The host cell of claim 8 transformed or transfected with an expressible polynucleotide encoding a peptide or polypeptide requiring post-translational formation of an LDN a GalNAc β 1,4GlcNAc structure thereon.

13. (Cancel)

14. (Cancel)

15. (Cancel)

16. (Cancel)

17. (Currently Amended) A method for producing a protein or peptide having a GalNAc β 1,4GlcNAc structure thereon, comprising the steps of:

providing a host cell having an expressible comprising an expression vector comprising a polynucleotide encoding a peptide or polypeptide requiring a GalNAc β 1,4GlcNAc structure and transformed or transfected with the vector comprising a polynucleotide encoding a β 4GalNAcT comprising SEQ ID NO:2; and
expressing in the host cell the β 4GalNAcT and the protein or peptide requiring the GalNAc β 1,4 GlcNAc structure thereon thereby forming a glycosylated protein or peptide having the GalNAc β 1,4GlcNAc structure comprising a β -1,4 linkage between the GalNAc and the GlcNAc; and
purifying the protein or peptide having the GalNAc β 1,4GlcNAc structure thereon.

18. (Cancel)

19. (Currently Amended) The method of claim 17 wherein the β 4GalNAcT β 4 acetylgalactosaminyl transferase comprises SEQ ID NO: 1 or a variant thereof having β 4GaleNAcT activity.

20. (Cancel)

21. (Cancel)

22. (Cancel)

23. (New) A method of glycosylating a protein or peptide, comprising:
providing a β 4 acetylgalactosaminyl transferase comprising SEQ ID NO:1;
and

exposing the β 4 acetylgalactosaminyl transferase to the protein or
peptide thereby forming a GalNAc β 1,4GlcNAc structure thereon,
the GalNAc β 1,4GlcNAc structure comprising a β 1,4 linkage between
the GalNAc and the GlcNAc.